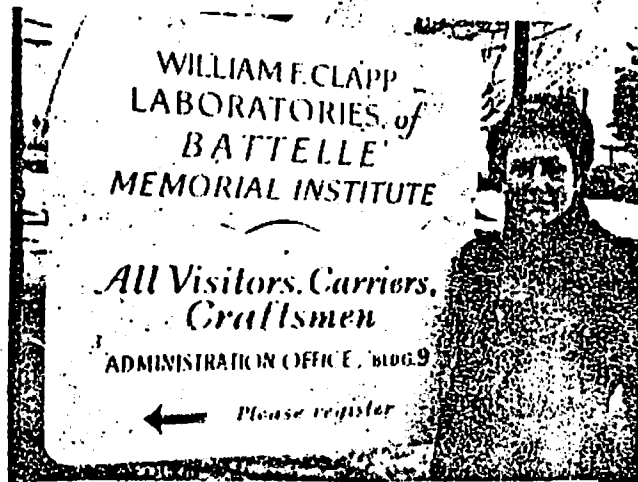


# The Clipper Visits Battelle Lab

By KAREN CHANDLER-MIDDLETON

PART II



Joan Sundstrom at entrance to Battelle Lab

After we left Irene, we walked the short distance to the 'Shore House' she had spoken of. It stood at the end of the drive, set among tall evergreens and fronted with shrubs. As we neared the building, I looked to my left at the broad grassy slope that stretched beneath a grove of trees towards the bay.

"Nice view," I said.

"Yes, that's our picnic grove. Beyond it you can see the dock area. That small building near the water is our pump house. We just installed new equipment. Water from the bay is pumped into our seawater system, circulated through it, then stored in underground tanks until it is removed from the premises. This eliminates any possibility of polluting the bay."

"Very efficient."

"Beyond the pump house our large raft lies moored between 2 jetties. It serves as a mooring location for our boats, and as floatation for suspended cages and trays we use. We take daily waste samples from that location as well, to measure temperature, salinity and pollution levels."

"Based on your testing, just how safe is the water is our bay?"

"Duxbury Bay has the cleanest water around. We use it for all our controls. The coliform level, however, which refers to levels of human waste present in the water, are increasing. The levels are by no means dangerous

Duxbury Clipper, Thursday, December 24, 1981

Increased boating has contributed to the increased pollution, as well as old sewerage systems designed originally for summer use only, which now must function year-round. We at Battelle are, however, monitoring the bay at all times. We'll be the first to know if anything is wrong. We assess not only pollution levels, but fish and shellfish resources. But we need to expand such activities, and set up additional monitoring stations. We need to monitor more of our shellfish beds, our rivers and marshes to properly maintain the abundant marine life in the area. We have been blessed with a healthy, prolific ecosystem here. We all have a vested interest in the bay, whether it is for research, recreation, or commercial fishing."

"Let's hope the town takes advantage of your capabilities and your location."

As we stood talking, 2 biologists, John Williams and Paul Perra, drove up in a truck which carried drums of oil. They circled the building and parked near several large, circular fiberglass tanks.

"We're simulating an oil spill in those tanks," Joan said. "We've been asked to study the impact of oil dispersants on marine life, particularly on molluscs. John and Paul have recreated conditions such as those on the Georges Bank, complete with ocean quahogs, flounder and scallops. In the 1970's it was found that dispersants spread on oil spills were more harmful to marine life than the oil. So now new materials have to be tested. The results will be interesting."

We left John and Paul hoisting the drums from the truck, and entered the 'Shore House'. "Upstairs we house our library," Joan began. "Scientific journals, texts, and reprints are available to staff members. It is not only well stocked, but it provides a quiet place to study or write. And here in this lab to our right I have been conducting bacteriological studies for a desalinization project headed by Holly Groelle, another of our biologists."

I glanced around the small lab. It was well equipped. Petri dishes containing Joan's cultures lined the counter. Microscopes, flasks, test tubes and small electronic testing equipment were arranged on shelves. Holly's notebooks were neatly stacked on the counter where she had been recently working. I could see her outside the rear window, however, walking down the driveway towards the administration building. She was an attractive young woman, dressed in white lab smock, and carrying a load of papers in her arms.

"Prior to this study," Joan's voice continued behind me, "Holly was involved in the fin erosion study on flounders. That's one of the pluses here at Battelle. We have an opportunity to work on a variety of projects. Creative thought is always welcome. There is always something new to learn in applying our particular skills. It is challenging for this reason. Let's go downstairs now where we can visit our algal room and biochemistry lab."

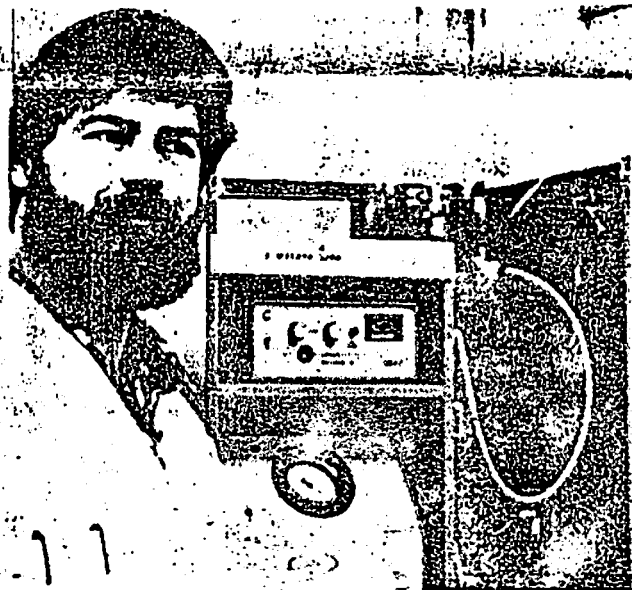


Rosanna Buhl using marine algal to test the toxicity of various effluent wastes.

We spiraled down a narrow stairway. It led into a small, well-lit lab. Rose Buhl, the phycologist, stood at the back of the room part way in the entrance to the walk-in growth chamber. Inside the chamber, glass flasks and 5-gallon carboys, containing phytoplankton of varying shades of green, stood on shelves beneath tubes of fluorescent light. Rose smiled at us and spoke before closing the door behind her.

"Here I culture all the phytoplankton, or microscopic algae, that we use to feed our animals and for testing material. I first prepare the growth medium in these large carboys. It consists of a mixture of chemical nutrients which we inoculate with algal cells grown in these smaller tubes. Growth requirements for light and temperature are maintained in our temperature-controlled growth chamber here." She closed the door and stepped forward. "Right now I'm working on a project in which we're testing phytoplankton to assess toxic effects of waste disposal. You can see here the different test tubes I have set up. It is a very interesting study."

Rose spoke to us for a few more minutes, answering questions. Joan then led us into the biochemistry lab. Dr. Scott Carr, a post-doctoral candidate, stood at one end of the large room, back to the door, reading figures from a read-out on one of his instruments. He turned and greeted us as we entered.



**Dr. Scott Carr processing a marine tissue for possible pollution stress using a glucose analyzer.**

"Here in our biochemistry lab we have been conducting stress testing on marine animals. We are looking for indices of sublethal stress in biochemical compounds such as glucose and ascorbic acid so that we can go out into the field and see if, indeed, these animals are stressed.

"We're fortunate here at Battelle to have the sophisticated equipment necessary to conduct our studies. That instrument over there, for example, is a high performance liquid chromatograph. It measures the level of ascorbic acid in tissues. Low levels reflect an increased demand on the part of stressed animals. And this is our electro-chemical detector. This machine is a liquid scintillation counter."

Scott's comments stimulated a number of questions from the group, which he answered carefully and completely, with an enthusiasm for his subject that impressed me. As he spoke I glanced around the lab, and looked at the equipment he had referred to. I thought how unique a facility Battelle was, to have such state-of-the-art equipment and so many modern laboratory facilities housed in picturesque New England colonial buildings.

We left Scott and filed out the back entrance to the 'Shore House'. The path led to the driveway, which curved down around the hill behind the building, through a grove of trees; and out again along the lab's 100 foot frontage on Duxbury Bay. Another 2-story lab sat on the waterfront. Next to it, the 45 foot research vessel, Mya, sat high in her cradle at the end of her launching railway.

"This is our Marine Lab," Joan said. "That canopied platform set next to the boat is our outside flow-through seawater station. It contains 2 large concrete tanks and a system of PVC piping through

which the water flows. That's Dr. Ron Bretler, another of our biologists, standing over the trays. He has set up an experiment to measure trace metal levels in sediments and shellfish."

I studied the arrangement. Water, pumped from the bay flowed through the PVC pipe into fiberglass trays hung across the large tank nearest the beach. Behind it, a set of overhead pipes carried water to a second tank. Tubing fed smaller amounts of water into separate containers filled with sediments. A digital monitoring machine ticked off a series of numbers as Ron adjusted the wires, took notes, and checked them against other data in his notebook. Beyond him, Duxbury Bay lay dark blue and slightly rippled in the early autumn breeze.

"Nice spot to work, Ron."

"Yes, it is, isn't it?" he smiled.

"How is the experiment going?"

"Very well. We should come up with some worthwhile data now that Rose and I have the apparatus set up and running smoothly."

We turned from Ron, who stood for a moment, silhouetted against the bay, watching us enter the Marine Lab. Once inside the building, we filed past more fiberglass trays set up beneath PVC piping. Seawater filled the trays where live clams and mussels lay in a single layer.

"This is a culture area. We do much of our flow-through bioassay work here as well." Joan led us through the room. "Upstairs is my lab."

We circled up another stairway. It opened out into an office to which Joan's lab was attached. "Here we are currently culturing Mysisopsis, or Mysis shrimp. They are used for stress-testing to determine toxicity levels of different substances sent to us by our sponsors, such as the EPA." Joan stood in front of a smaller room off the lab which contained shelves lined with aquaria. "These small funnels contain Artemia, food for the Mysids. Over here in this aquarium, we developed a system for producing 24-hour old specimens required by the EPA for this particular project. It was a simple enough procedure to set up once we understood the animal's life cycle and propagation."

The small dishes containing the mysidopsis were set on a counter in the center of the room. Behind them, in the separate culture room, Mysids swam leisurely in their aquaria. Sunlight filtered into the small area from a window set in the back wall. Past it, water from the bay lapped steadily against the narrow stretch of beach that lay behind the building. At the north end of the lab, through another window, Mya's forward cabin, half hidden by the lower sill, was visible. After listening with interest as Joan explained her experiments, I walked over to the window to get a better view of the waterfront property.

...an addition to what you see here from this window, we will have by spring, I hope, a new Marine Lab." Joan had joined me at the window, and stood pointing north. "Originally it was to have been an extension of this building with a wet lab underneath, bioassay facilities, environmentally controlled rooms for testing, offices and conference rooms. Now, Battelle is so excited about the work we're doing, that they are talking about another building. It will house the modern facilities I spoke of, in a building in keeping with the New England atmosphere of the Lab. We hope construction will begin as soon as possible. Once the building is complete we will have an open house."

"Battelle is really growing, isn't it?"

"Yes. Funding in the marine biology field has been difficult for the past few years. Now, however, the field is really opening up. Our growing reputation as a center for marine research has resulted in major new contracts. Because of the money and the projects available, we're drawing a number of famous people. Dr. Jerry Neff, from Texas A & M on our staff, is an example of the kind of scientists we attract. He is a world famous research biochemist, and a leading expert in oil spills. We have other scientists interested in joining us once new projects are under way. These same projects will mean more jobs for interested residents of Duxbury as well."

"Your new name reflects a future far removed from Dr. Clapp's old schooner-moored in the bay where his original research began."

"This is an exciting period we are entering. There is a feeling of enthusiasm and commitment among the staff. The projects we are getting are exciting, and the planned expansion of facilities and staff will make the Lab even more valuable to us and the sponsors."

"Dr. Tony Graffeo, your director, has done a fine job of promotion and recruitment for the Lab."

"Yes, he has."

"Speaking of promotion, these tours are a new idea this fall, aren't they?"

"They are another of Tony's ideas, and one we all endorse. We're proud of our facilities, our research, and our position in the scientific community. We want residents of our town to see what is going on here. We feel that we represent an important link between what is happening in present day science, in Wood's Hole and in Boston, for example, and Duxbury itself. We're constantly encouraging the community as a whole, and the schools in particular, to tour our facilities and learn more about marine biology. We're talking to the community, the Garden Club, the Men's Club and the Rotary."

"We feel, however, that our greatest role in the community is as an educational resource for the schools. We have contacted the schools to arrange special tours for students and to give talks. John

## CLAPP LABS

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Williams recently spoke at the Alden school. I have spoken with the intermediate and high school as well. We are planning several programs with the Duxbury school system including a Scholarship Fund, a competition next summer for research internships for qualified Duxbury students, and participation in new courses being planned by the school system. It is exciting to think that we can interest some of these students in science as a career."

By now, other members of the tour had joined us, and listened as Joan spoke. "We're blessed with our own natural laboratory here in Duxbury, aren't we?" a woman asked. "The bay, the outer beach, the marshes, the fish and shellfish offer us a real opportunity to learn more about the marine world. And where better to begin than in our own schools!"

We took another long look at the bay, and beyond it, the outer beach. In silence, we left the building and walked back up the driveway, past the Shore House and towards the Main Lab. As we passed the small white cottage tucked in the hillside beneath the Main Lab, I thought of Irene, working steadily at her research. I thought of that old shipworm riddled plaque, which hung high on the wall in the larger building, and bore tribute to Dr. Clapp's original research. Enlarged and diversified as the lab had become in the years following Battelle's acquisition of the facilities, a change reflected in the new name, there still existed that underlying dedication to creative scholarship in applied research, characterized by Dr. Clapp and his staff, that had won worldwide recognition and respect for the Lab.